in the good I desire for myself, so I am conscious that it is only a minor element in the good I believe it my duty, say, as a father to promote for my child; and, as I say, I believe this conviction to be shared by the generality of high-minded men who are not pre-committed to any particular scheme of moral philosophy.

It may, no doubt, be said that the view is a mistaken one, but at least it is there, and it is a serious defect in a proposed analysis of actual morality that it leaves no way of accounting for the fact. Where Prof. Westermarck, if I may say so without presumption, goes wrong is in directing his attention primarily to the kinds of emotion which accompany moral judgments instead of attempting to study just the general character of the conduct upon which the judgments are passed. As Mr. Bradley put it long ago, with reference to J. S. Mill's account of poetry, "Anything in the way of shallow reflection on the psychological form rather than an attempt to grasp the content." It is the same undue preoccupation with psychological form as opposed to ethical content, as it seems to me, which makes Prof. Westermarck's attempts to trace and forecast the development of moral belief and practice disappointing. He has little that is suggestive to say about the actual development of the moral ideal within the history of civilisation; indeed, about the oldest and perhaps the most influential of still existing moral institutions, the Christian Church, he always writes with a lack of appreciation which might fairly have been blamed in an eighteenth-century *illuminé*, though one would have expected that, in its Catholic form, it would have appealed to him in virtue of its "cosmopolitanism." The chief prophecy he makes as to the future is that "the altruistic sentiment will continue to expand." Whether this is a prophecy of good I am not sure. No doubt it is, if it means that devotion to a common good is to become a more prominent factor in all our action. If it means that devotion to definite organisations for social life is to be replaced by aimless amiability towards the human race in general, there may be reason to doubt whether the substitution would be in the direction of genuine progress.

A. E. TAYLOR.

POPULAR ELECTRICITY.

Electricity Present and Future. By Lucien Poincaré. Translated by Jasper Kemmis. Pp. viii+315. (London: Sisley's, Ltd., n.d.) Price 7*s.* 6*d.* net.

THE title of this book is certainly a misnomer, and any reader expecting therefrom to find the volume largely occupied with a prophecy of the future development of electricity is destined to be disappointed. Had the book been called "Electricity Past and Present," the subject-matter would have been much more correctly indicated, as a fair amount of historical matter is combined with the description of the present state of applied electricity. Regarded simply as a popular exposition of this state, the work has much to recommend it, but it is, perhaps, hardly fair to the author's intentions to look on it simply in this light. From the preface one gathers that the intention has been to trace the tendencies observable in recent developments in electrical engineering, and to produce a work, to use the author's own words, "not unworthy a place in a collection of studies in scientific philosophy." Candidly, we must admit that we are not impressed with the "scientific philosophy" of the book, unless, indeed, it is philosophy to show how the simpler forms of machines and apparatus have been modified to suit the varied requirements of modern industry.

The first part of the book is occupied with theoretical matters, the main outlines of the theory of magnetism and of induction being clearly expounded. Then follow two chapters on generating machines and motors, a fairly long chapter on the transmission of energy, and finally two short chapters on electrochemistry and electric lighting. These chapters form the main portion of the book; they are clearly written, and give a clear and interesting account of the subjects with which they deal. We cannot help thinking that the addition of a few simple diagrams and illustrations would greatly assist the explanations of some of the more complicated points; the reader whose knowledge of electrical technology is not very extensive is likely to find some of the passages difficult to follow. Indeed, we think the whole book, excellent though it is in many respects, would be greatly improved by simplification and a frank abandonment of the philosophic aims which have helped to inspire it, and which have given rise, we think, to such defects as it possesses. Amongst such defects may be noted certain peculiarities of style which are apparently attempts to give the book a literary value, but which, in our opinion, have just the reverse effect. To quote one or two examples, we read, on p. 38, "M. Warburg justly claims the distinction of having been the first, in 1880 . . ." when we suppose all that is meant is that M. Warburg *has* the distinction, &c. On the same page a sentence referring to Ewing's work on hysteresis is immediately followed by a paragraph opening, "This same Ewing studied in all their complex details these phenomena." Why not say Ewing studied these phenomena in all their complex details? Instances could be multiplied almost indefinitely, but we will content ourselves with one other quotation. On p. 27 we read:—

"However, notwithstanding the high respect entertained for the ventures of this great scientist (*Faraday*), whose experiments were the most original and productive that science had seen in the nineteenth century, and notwithstanding the lucidity of his 'Experimental Researches in Electricity,' one cannot but feel surprised, even shocked, at the methods he employed in describing matters which are not in consonance with the conventional forms of mathematical symbols."

We are not quite sure what is the meaning, if any, of the last sentence, and whether it is the "methods" or the "matters" which offend; but assuredly the criticism is most unjust, and the author (or is it the translator?) could not do better than study that simplicity of language which enabled Faraday to confer such "lucidity" on his writings. After all, M. Poincaré is attempting a similar task in

this book in endeavouring to present the position of electrical theory and practice by methods "not in consonance with the conventional forms of mathematical symbols."

There is one matter to which we feel we must refer in conclusion, though it does not affect the general merits of the book. Surely never was an index more curiously compiled since someone wrote, "Mill, on Liberty: do., on the Floss" in a book catalogue. What can be said of such entries as these? "Both fields interdependent," as a reference to the interdependence of the electric and magnetic fields; "First Consul's opinion"; "Electricity, mystery of, 4; physicists cannot explain, 5; contingencies increase, 6; reason obvious, 7"; "Whence mechanical work?" If the rest of the index were comprehensive and well-arranged, such peculiarities might be excused as, possibly, intentionally humorous; but unfortunately such is not the case. Thus arc lamps are indexed under "Lamps, arc," but incandescent lamps under "Incandescent," and there are no cross-references. Also, in the preface a full list of the names referred to in the book is promised in the index, but the majority are not to be found there.

MAURICE SOLOMON.

THE CAUSES OF MUTATION.

Mutation et Traumatismes, Etude sur l'Evolution des Formes végétales. By L. Blaringhem. Pp. 239; 8 plates. (Paris: Félix Alcan, 1908.) Price 10 francs.

ACCORDING to the mutational view of evolution, the kind of variations to the survival of which specific differentiation is due are not such differences between individuals as are always afforded, in any large collection, by fluctuating variability; but variations of an entirely different nature, which de Vries has called mutations. These mutations are not, as repeatedly stated, larger differences than those which are due to fluctuating variability. On the contrary, the differences between the extreme variants of fluctuating variations are often so large that they cannot escape the notice of the most unobservant; whereas the difference between the new types (especially when these are elementary species, and not varieties) which arise by mutation are often so subtle that they can often only be detected by an observer with an intimate familiarity with the species in question.

The great difference, according to de Vries, between these two types of variation is that the maintenance of any new stage which has been reached by the selection of the extreme variants of fluctuating variability is dependent on the continuation of the selection which produced it, whereas the new types which arise by mutation are independent of selection. Of course, if the new types are sickly or are characterised by the acquisition of new characters which interfere with their attainment of maturity they very soon cease to exist. The point is that the origin of the new type on the latter view is independent of selection, whilst on the former it is due to it; and this holds good for the origin of new types in a state of domestication as well as in wild nature. The new form "is seen to be very good after, not before its creation."

But perhaps the most striking difference between the two kinds of variation is that fluctuating variability is exhibited by all animals and plants at all times, whereas mutability appears to be exhibited only very rarely. Indeed, de Vries only found one plant which appeared to be in this state (Œnothera), although he tested a large variety of plants for the purpose. Now, if it is true that evolution is due to the differences presented by mutability, we naturally want to know to what these mutable phases are due; and it is a paradoxical fact that de Vries should have discovered a great deal about the causes of fluctuating variability and next to nothing about those of mutability. A great many of the differences which are classed as fluctuating can be attributed with great certainty to differences of nutrition, and there is a long series of facts (in connection with the limit attainable by the selection of such variations) which go to support this explanation.

Of the causes of mutation little is certainly known, though it is generally held that the inception of a mutable phase is caused by some disturbance of that equilibrium in the germ-plasm which expresses itself in the stability of a species which is not in a mutable state. Indeed, the generality of a belief in that form of variation which has since been called mutation, and of this view, as to the cause of it, is witnessed by the existence of a special French word, "affoler," to express the process by which this disturbance of the equilibrium may be effected. The term "affolement" is also used by gardeners to signify the state which this brings about, in other words, the mutable phase itself. The book before us is an account of a long series of experiments which M. Blaringhem has conducted on the effect of mutilations on the maize and other plants. He finds that the buds which are produced after such mutilation (such as severing the stem) bear a far larger number of abnormal organs —stems, leaves, flowers, and fruits—than do normal unmolested plants; and, moreover, that amongst the offspring of mutilated plants there occur (1) considerable monstrosities; (2) plants which have recovered the ancestral equilibrium; and (3) very occasional slight anomalies which constitute varieties and are perfectly new and constant.

M. Blaringhem has come in touch with the outskirts of an extremely interesting problem, namely, the effect of the rate, at which vital processes take place, on their normality. It may be that the luxuriance of life in the tropics is due to the speed at which ontogenetic processes take place there; if heat increases the rate at which growth takes place (as it is known to), and increased speed leads to increased variability, the luxuriance of tropical life may be simply due to wide range of variations placed at the disposal of natural selection to operate upon. Similarly the enormous speed at which growth proceeds in buds produced on plants which have been cut down to the ground may be the sole cause of the increase in the number of monstrosities produced by them. Here is matter for investigation, the results of which ought